

# INFORMATION PROCESSING APPARATUS SUPPORT SYSTEM WITH SUPPORT ARMS WHICH ARE CAPABLE OF CLOSING TOWARD A KEYBOARD UNIT OR AWAY FROM A KEYBOARD UNIT

This application is a continuation of application Ser. No. 07/847,671 filed Mar. 4, 1992, now abandoned.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates to an information processing apparatus which includes a display unit supporting means for holding an information display unit which displays information.

### 2. Description of the Prior Art

Information processing apparatuses having the above-described function are classified into various types, such as computers, word processors, image processing apparatuses and the like. Particularly in portable image processing apparatuses having the above-described function, in many cases a display unit supporting means for holding an information display unit is integrally connected to the main body of the display unit is integrally connected to the main body of the apparatus including an input means, such as a keyboard or the like, so as to be foldably accommodated, in consideration of convenience while being carried. In such a foldable type, the display unit supporting means is connected to the main body of the apparatus by a mounting mechanism which can hold the display unit supporting means at an opened position so as to be easily seen while being used.

FIG. 16 is a perspective view illustrating a conventional mechanism of mounting for a display unit supporting means with respect to the main body of the apparatus. The mounting mechanism shown in FIG. 16 utilizes a tightening torque and a loosening torque of a torsion coil spring 52, and is configured so that larger damping is applied when a display unit supporting means 51 is opened than when the display unit supporting means 51 is closed. If an information display unit (display surface) 53 reaches a predetermined position exceeding the vertical plane, further opening is prevented by a stopper or the like provided at a main body 54 of the apparatus. The display unit supporting means 51 supports the information display unit 53, and is rotatably (openably and closably) connected to the main body 54 of the apparatus by the mounting mechanism. A keyboard 57, serving as an input means, is provided in the main body 54 of the apparatus.

According to the provides of such portable personal computers and word processors, the range of users has widened. In personal computers (hereinafter termed PCs) and the like, however, the operation of inputting commands from a keyboard is complicated, and it is necessary to memorize a large number of commands. Such a fact hinders the use of PCs and the like. Accordingly, in order to widen the range of users, it is necessary to remove difficult processing as much as possible. For that purpose, many newer PCs have adapted an operational environment which uses icons (illustrations). In such operational environment, when an apparatus performs certain processing, an operation of selecting an icon on a display surface is performed in place of inputting symbols or characters using a keyboard or the like.

In the above-described operational environment which uses icons, a mouse or a touch panel is used as a user

interface. The touch panel indicates an input means which is mounted on the front surface of the information display surface (the information display unit 53 shown in FIG. 16), and receives predetermined information by detecting coordinates of a portion of the surface depressed by a finger, a pen or the like. Although optical types combining light-emitting devices and photosensors provided around a display surface, membrane types which use a transparent conductive film, pressure types which use a pressure sensor, and the like are adopted for the touch panel, pressure types are typical.

FIG. 17 is a schematic perspective view illustrating the principle of the above-described pressure-type touch panel. In FIG. 17, pressure sensors 55 are mounted at four surrounding points on a glass plate superposed on a display surface of an information display means. Partial pressure of the pressing force when a touch panel 56 formed on the surface of the glass plate is pressed is measured, and the coordinates of the pressed portion are calculated based on the measured value.

If a mouse is used when realizing operational environment which uses icons (illustrations) in a portable PC, it is necessary to always carry the mouse in order to use an apparatus (information processing apparatus). Accordingly, this approach has the disadvantage that it is necessary to provide an area sufficient for operating the mouse.

In work stations represented by PCs, word processors and the like, a keyboard is used as a means for inputting data and commands, and a display is used as a means for displaying storage of input data and the presence/absence of commands. Other input means for assisting the above-described keyboard are also available. Mouses and touch panels are typical.

The above-described touch panel is disposed on the surface of the above-described display, and can perform an input operation by directly accessing an image displayed on the display by a finger, a pen or the like. Hence, the touch panel has attracted notice since it is more humanlike than the mouse. Particularly in a retrieval operation wherein a desired switch is selected from among a large number of switches displayed on the picture surface, utilization effect of the touch panel is large, and various kinds of software for such an operation have been developed. In addition, work stations mainly using touch panel operations, wherein a keyboard is used for data input, and a dedicated touch panel is used for retrieving and extracting operations, have appeared.

In accordance with the reduction of the size of work stations, a flat display and a keyboard occupy the entire space of a work station. As a result, apparatuses, wherein a display is rotatably (openably and closably) mounted around a rotation fulcrum disposed in the vicinity of a keyboard, have appeared. FIG. 50 is a side view illustrating a conventional work station of such type. In FIG. 50, a keyboard 52 is provided at a front portion of a main body 51 of the apparatus, and a flat display 54 is rotatably mounted around a fulcrum 53 provided in the vicinity of the keyboard 52. A touch panel is in some cases provided on the display surface of the display 54.

The conventional work station shown in FIG. 50, however, has a problem to be solved such that, if the touch panel provided on the display surface of the display 54 is mainly used, the operation of the touch panel is troublesome since the keyboard 52, which is unnecessary for the operation of the touch panel, is disposed at the front side. In order to solve such a problem, a configuration may be considered wherein the display surface of the display 54 is moved from